WIND ENERGY POTENTIAL IN

ENVIRONMENTAL AND ENERGY POLICY

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1. Introduction

I appreciate this opportunity to address the Senate Commerce Committee regarding the role of wind energy in establishing balanced environmental and energy policy. I am Dennis J. Duffy, Vice President of Regulatory Affairs of Energy Management, Inc. ("EMI"). EMI is a privately-held company with twenty-five years of experience in the energy business. As our name implies, our original business was advising industrial energy users as to the conservation and optimal use of energy resources. We subsequently focused on the development and operation of major electrical generation facilities and, over the past decade, raised $1 billion in project capital and developed some of the most efficient gas-fired plants operating in the United States. As of December of 2000, however, EMI has sold all of its fossil-fueled units and is now focusing exclusively upon wind energy development. As indicated by this shift in energy market segment (and the associated commitment of our capital), we are confident that wind energy technology has now advanced to the point where it is proven and reliable and can play a much more meaningful role in our national environmental and energy policy.

2. Benefits of Wind Energy

A. Environmental Benefits

As an initial matter, the environmental benefits of wind generation are striking. As the Committee is no doubt aware, the combustion of fossil fuels for the production of electricity is one of the most important factors affecting air quality throughout the nation. While fossil fuels will certainly remain an integral part of our national energy portfolio, the important point is that, as of today, renewable technologies have developed to the point where substantial portions of our energy needs can be met

without the combustion of fossil fuels or the environmental issues associated with nuclear power. By way of example, we are currently developing an approximately 400 megawatt wind facility to be located five miles off the coast of Massachusetts that would each year offset the combustion of (i) 85,000,000 gallons of oil or (ii) 500,000 tons of coal that would be required to produce an equivalent amount of electricity utilizing traditional technologies. Further, today's wind projects can be designed and sited in a manner that is environmentally sensitive and compatible with existing land and marine uses.

B. **Diversification Benefits**

Wind energy also furthers the important energy policy objectives of diversification of supply and reduced dependence upon imported fuel. Diversification of supply is important to both maintaining price stability and to the continued reliability of electrical service. As experiences over the last year have taught us, electricity prices are directly linked to the often volatile and unregulated pricing of fossil fuels. In this regard, the addition of substantial amounts of wind-generated electricity to supply portfolios would provide a valuable hedge against fuel price spikes and effectively mitigate the volatility of the energy markets. Further, the current state of regulatory affairs has induced the overwhelming majority of new plant construction to utilize a single fuel – natural gas, a growing dependence which has caused market managers serious concern.[1] The inclusion of significant portions of wind generation in future supply portfolios mitigates these reliability concerns, while at the same time mitigating electric price volatility.

[1] For example, the Independent System Operator of New England ("ISO-NE") released a report earlier this year noting its serious concern over this potential over-reliance upon a single source of fuel whose deliverability has not been fully assured.

C. **Overall Consumer Cost Savings**

Additional wind units would also cause consumers in deregulated power pools to see substantial reductions in their overall power costs. All sellers into these pools are paid the same "clearing price" reflecting the marginal (i.e., primarily fuel) cost of the last generating unit dispatched in any given hour. Each pool prioritizes and dispatches its generating units in "economic merit" order, from the lowest to highest marginal cost bids, until sufficient units are dispatched to meet customer demand, with the last/most expensive unit dispatched setting the clearing price for the entire pool. The key point is that because wind units have a marginal cost of zero, they will displace higher marginal cost units from the economic dispatch and thereby place downward pressure on pool clearing prices in every hour of every day. Because the resulting reductions in clearing prices are then applied to the entire volume of electricity trading in the pool, there is a multiplier savings effect, so that costs of supporting wind industry development result in far greater cost savings to the consuming public. The bottom line is that, in deregulated power pools, you can spend more for wind energy and still substantially reduce overall power costs to the public.

3. **The Proven Performance of Today's Wind Technology**

Obviously, the degree to which wind energy may be relied upon to further the foregoing policy objectives depends upon the performance of the underlying technology. In this regard, reference to the world-wide growth of wind energy confirms that the technology has advanced to the point where it is not only proven and reliable, but also a leading source of new generation in the global market. The American Wind Energy Association ("AWEA") recently summarized the global acceptance and implementation of wind power in the following matter:

> Total worldwide wind capacity today is approximately 17,000 mw, enough to generate about 34 billion kilowatt-hours of electricity each year. This is about the same amount of electricity as 5 million average California households (containing 12.5 million people) use. Wind energy was the world's fastest-growing energy source during most of the 1990's, expanding at annual rates ranging from 25% to 35%. In 2000, about 3,500 mw of new wind capacity (close to a $4 billion investment) was installed around the world, but only 53 mw of that total, or little more than 1% was installed in the U.S.

This world-wide growth in wind power is shown in graphic form on Attachments 1 and 2 hereto. Also notable is the marked trend in the European markets towards offshore wind facilities, of which more than 3,000 mw are now under development, as indicated on Attachments 3 and 4, with a representative project shown in Attachment 5.

This international growth in wind generation provides a practical validation of today's wind turbine technology. Indeed, Denmark now obtains approximately 20% of its power from wind resources and northern portions of Germany have achieved even higher concentrations. Importantly, the European experience has also demonstrated that utility systems can operate in a safe and reliable manner with concentrations of wind resources far in excess than those now existing in the United States. With respect to the potential for wind energy in the United States, AWEA has stated as follows:

> The leading [US] states in terms of installed wind capacity are California (1,646 mw), Minnesota (272 mw), Iowa (242 mw) and Texas (188 mw). US wind potential is enormous—many times the amount installed. California's potential, for example, is conservatively estimated at 5,000 mw of wind capacity. Other western states have much larger potential—e.g., Wyoming has more than ten times California's. The U.S. is, quite literally, a "Saudi Arabia of wind," with vast resources throughout the Plain States.

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AWEA expects as much as 2,000 mw of new wind capacity to be installed in the U.S. this year.

4. **Policy Issues for Wind Energy**

Notwithstanding the proven performance of wind technology, further inroads into the U.S. market still require a degree of market and regulatory support. Most important is the extension of the Production Tax Credit ("PTC"), which currently provides an income tax credit for the production of electricity from qualified wind energy facilities. While I am happy to note that there is bipartisan support for an extension of the PTC, some proposals would provide only a three year extension, whereas others propose a five year extension. It is extremely important to the wind industry that the PTC extension be for a period of not less than five years. The global demand for a new wind turbines has created substantial doubt as to the ability of manufacturers to produce, deliver and install new units within a three-year window. Thus, a PTC extension of at least five years necessary in order to accommodate limited production capabilities.

Another policy initiative important to the growth of the wind industry in the U.S. market are Renewables Portfolios Standards ("RPSs"), a "minimum content requirement" specifying that a certain percentage of electric supply portfolios must be obtained from renewable energy resources (wind, solar, and others), either through direct purchase of electricity or the indirect purchase of "green credits" or certificates. Several states have included such RPS requirements as part of their electric utility restructuring legislation. Texas, for example, has set a RPS requirement of 2,000 mw of new renewable energy generation by the year 2009, and one-half of such amount (1,000 mw) will be met by wind generation that will be in service by the end of this year. Massachusetts similarly included an RPS requirement in its electric restructuring legislation, which requires that 10% of all retail supply portfolios be supplied from

renewable resources by 2010. We believe that such requirements are a sound policy tool to ensure that the public benefits of renewable power are not frustrated by the established order in the electric industry, and would strongly support initiatives for a RPS requirement as a matter of Federal policy.

Finally, we believe that it is important to encourage utilities to consider long-term purchases of renewable energy as part of their overall portfolio planning. While some restructuring plans encouraged utilities to rely primarily or exclusively upon short-term purchases, experience has shown the undue volatility that can result. Further, long-term pricing more fully recognizes the competitive value of wind energy and its ability to provide an economic hedge against market volatility through pricing that can remain fixed irrespective of fuel prices.

5. Conclusion

In closing, I wish to reinforce our conclusion, based upon our experience in the energy business and of the current state of technology, that wind energy is a proven and reliable option that can play a much greater role in the nation's environmental and energy policies. While the environmental benefits of clean and renewable generation are obvious, wind energy would have the additional benefits of (i) reducing overall customer costs, (ii) mitigating fuel-driven price spikes and (iii) improving system reliability through diversification of supply and reduced reliance upon imported fuels. Although wind technology has been validated in the global arena, it remains a developing industry in the U.S. which requires both market and regulatory support in order to make the inroads into the established market that would further the national interests of environmental and energy policy.

Thank you.